Technology Opportunity

Real-Time Sensor Data Validation System

The National Aeronautics and Space Administration (NASA) seeks to transfer real-time sensor validation technology and tools which ensure data integrity through automated detection of sensor data failures.

Potential Commercial Uses

Any application where data integrity is essential.

- Power Generation
- Chemical Process Industry
- Aerospace
- Product Manufacturing
- Automotive Industry

Benefits

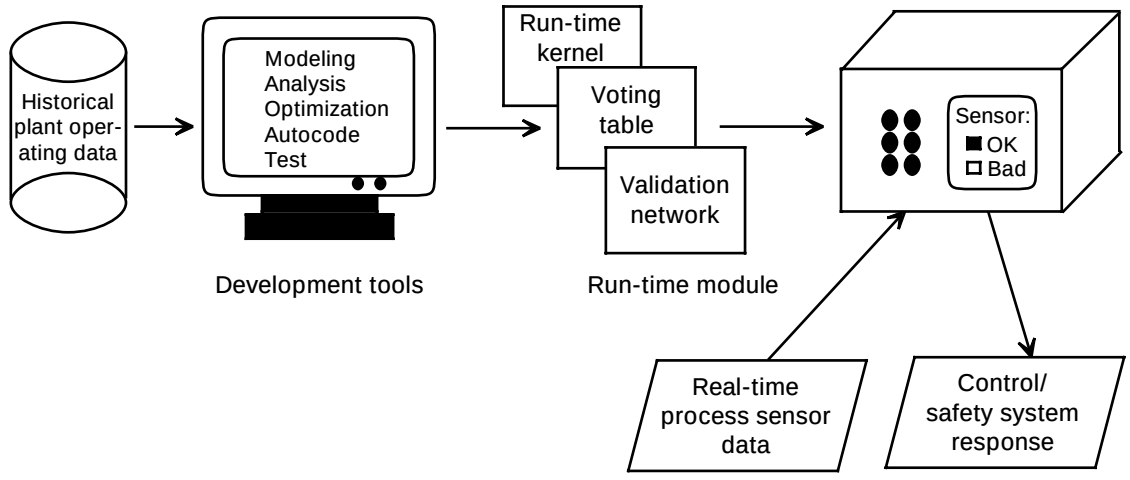
- Enables rapid, cost-effective production and maintenance of sensor validation systems.
- Mathematical details of validation network analysis and optimization are transparent to the user.
- Production of embeddable ANSI C source code is fully automated.
- Improves system dependability by elimination of false alarms due to sensor anomalies.

The Technology

Real-time sensor data validation improves process monitoring and control system dependability by ensuring data integrity through automated detection of sensor data failures. Tools have been developed which enable systems engineers to automatically generate software that can be embedded within an application. The sensor validation methodology captured by the tools is scalable to validate any number of sensors, and permits user specification of system sensitivity. The resulting software reliably detects all types of sensor data failures.

Data failures are defined as any failure that corrupts the sensor signal and provides erroneous information to a process control or monitoring system. In order to identify these failures in real time, system design relationships, which are captured within individual models, and Bayesian probability theory are combined. A set of sensor readings and the set of system models form a network of cross-checks used to validate all the sensors contained within the network.

Automated Production of Embedded Run-Time Sensor Validation Systems



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Options for Commercialization

The sensor data validation system was developed by NASA Glenn Research Center in cooperation with ISAI/ExperTech. ISAI/ExperTech has copyrighted all software and has initiated patent proceedings for portions of the software design. Researchers are seeking partnership with industry to transfer and further develop the technology. A prototype set of software tools for network development and automated production of embeddable code is complete and available for commercial application demonstration.

Contact

Commercial Technology Office
Attn. TOPS
NASA Glenn Research Center
Mail Stop 7-3
21000 Brookpark Road
Cleveland, OH 44135
Phone: (216) 433-3484
Fax: (216) 433-5012
E-mail: cto@grc.nasa.gov
http://cto.grc.nasa.gov

Key Words

Redundancy
Information theory
Correlation
Statistical analysis
Bayes theorem
Probability theory
Real-time operation

M–0239–59

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Space Administration

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